

REMARKS

Claims 23, 27, 28 and 29 have been amended in response to formalities-type issues. No new matter has been added by virtue of the amendments.

It is believed the objection under 37 CFR 1.75(c) has been obviated by the amendments made herein.

Claims 23, 27 and 29 were rejected under 35 U.S.C. 112, second paragraph.

To expedite prosecution, claim amendments have been made to obviate the rejection. It is thus submitted that the rejection should be withdrawn.

Before addressing the Section 103 rejections in detail, a brief discussion of Applicants' invention should be helpful.

Applicants have discovered copolymers that comprise: at least one repeating unit that is a meta-hydroxyphenyl derivative; at least one repeating unit that is a para-hydroxyphenyl derivative; and one or more photoacid labile groups. See page 2, last paragraph of the application.

Particularly preferred polymers of the invention have repeating units that have a single hydroxy moiety on the meta-hydroxy-phenyl group. See page 4, lines 1-4; and page 5, last two lines of the application. Acrylates are preferred acid labile groups, such as tert-butyl acrylate.

Applicants discovered that addition of a meta-hydroxyphenyl unit to a polymer containing para-hydroxyphenyl units and acid-labile units can quite favorably impact dissolution rates and solubility differentials between expose and unexposed regions of a resist coating layer that contains the polymer. See page 3, first paragraph of the application. See

also, the comparative results set forth in the Rule 132 Declaration of record.

Claims 1-20 were rejected under 35 U.S.C. 103 over Watanabe et al. (U.S. Patent 5,844,057). As the rejection is understood, Watanabe is cited for a report of phenyl groups that have multiple hydroxy substituents. Watanabe is also cited for a polymer that has acid labile groups pendant to a phenyl group. The rejection is traversed.

Applicants' independent claim 1 reads as follows:

1. A photoresist composition comprising a photoactive component and a resin that comprises a polymer that comprises 1) an acid labile group; 2) a meta-hydroxyphenyl group; and 3) a para-hydroxyphenyl group, wherein the meta-hydroxyphenyl group has a single meta-hydroxy moiety and is unsubstituted at other available ring positions.

Applicants' independent claim 23 reads as follows:

23. A photoresist composition comprising a photoactive component and a resin that comprises a polymer that comprises 1) an acrylate acid labile group; 2) a meta-hydroxyphenyl group; and 3) a para-hydroxyphenyl group.

Watanabe clearly does not teach or suggest such photoresists.

In particular, with respect to claim 1, Watanabe reports polymers wherein phenyl units have multiple ring substitution. See columns 23 through 30 of Watanabe.

Nowhere does Watanabe report a polymer that contains a meta-hydroxyphenyl group that is unsubstituted at available ring positions other than by a single meta-hydroxyphenyl moiety.

Nor does Watanabe et al. suggest polymers that contain an acrylate acid labile group as recited in Applicants' claim 23. Rather, Watanabe reports linking acid labile groups onto phenolic groups.

While Applicants fully believe that a *prima facie* case of obviousness is not presented by the cited art, Applicants also direct attention of the Rule 132 Declaration of Dr. Pandya, a co-inventor on the application. That Declaration was previously made of record in this case, and a copy is attached.

That Declaration details significantly reduced dissolution rates provided by polymers of the invention that include meta-hydroxyphenyl units, relative to comparable polymers that do not include meta-hydroxyphenyl units. Such reduced dissolution rates can provide significantly enhanced lithographic performance of a photoresist that contains the polymer. See page 3, first paragraph of the application.

In view thereof, reconsideration and withdrawal of the rejection are requested.

Claims 1-34 were newly rejected under 35 U.S.C. 103 over Urano et al. (EP 0780732A2). As grounds for the rejection, the position is taken:

Urano et al.'s polymer (b) which is represented by the formula [2] shown on pg. 7 contains a single -OH substituted styrene repeating units. Since the formula does not restrict the position of the hydroxy group on the phenyl ring, it is the Examiner's position that some of the styrene repeating units could have a single hydroxy group on the meta position (and unsubstituted at other ring positions as presently claimed) and the rest of the styrene repeating units could have the single hydroxy group on the para position. Therefore, it is the Examiner's position that the prior art's formula for the polymer (b) encompasses a polymer having meta-hydroxyphenyl group and a parahydroxyphenyl group which is presently claimed.

The rejection is traversed.

Urano et al. adds nothing more than the Watanabe citation. Applicants' comments regarding Watanabe are repeated and incorporated herein by reference in response to Urano et al.

Briefly, the mere report of a polymer having a phenolic group with hydroxy group in unspecified position clearly does not provide a suggestion of a polymer containing at least three distinct units of: 1) an acid-labile group; 2) a meta-hydroxyphenyl group; and 3) a parahydroxyphenyl group.

Indeed, none of the Examples of Urano include a polymer having a meta-hydroxyphenyl group.

Moreover, Applicants have demonstrated performance differences upon use of a meta-hydroxyphenyl group. See the Declaration of Dr. Pandya, of record and discussed above.

In view thereof, reconsideration and withdrawal of the rejection are requested.

Claims 1-7, 10-27 and 30-34 were rejected under 35 U.S.C. 103 over Hinsberg et al. (EP 0596668A2). The rejection is traversed.

Hinsberg has common inventorship and ownership with the present application. Hinsberg has a listed assignee of International Business Machines Corporation, and the present application has assignees of the Shipley Company and International Business Machines Corporation.

Hinsberg et al effectively **teaches away** from Applicants' claimed invention. Hinsberg reports use of *either* a para-hydroxystyrene **or** a meta-hydroxystyrene group. Hinsberg clearly does **not** contemplate or otherwise suggest a polymer that contains **both** para-hydroxyphenyl **and** meta-hydroxyphenyl groups as Applicants disclose and claim, much less the surprising performance results such polymers can provide.

For instance, Hinsberg et al. reports the following regarding a two-unit polymer (column 6, lines 11-24; bold emphasis added; this report also cited in the Office Action):

A preferred copolymer is preferably formed from the reaction of hydroxystyrene monomer and a second monomer having an acid cleavable group. **The hydroxystyrene is suitably the para OR meta isomer** and can be substituted with various substituents which do not interfere with the process of resist image formation, such as halogens, methoxy, or lower alkyl (e.g. methyl or ethyl). Hydroxy- α -methylstyrene can also be used. The second monomer is suitably alkyl acrylate or alkyl methacrylate, preferably where the alkyl substituent is a t-butyl group or an α -methylbenzyl group. Preferred copolymer are meta and para poly(hydroxystyrene-co-methacrylate/acrylate).

The examples of Hinsberg et al. only report polymers that contain either a meta-hydroxy group or a para-hydroxy group.

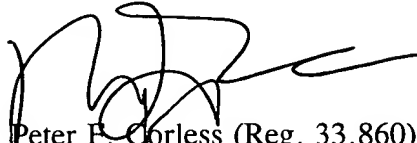
Attention is also directed to the Rule 132 Declaration of record.

In view thereof, reconsideration and withdrawal of the rejection are requested.

It is believed the application is in condition for immediate allowance, which action is earnestly solicited.

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Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Peter F. Corless', with a long horizontal flourish extending to the right.

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